

**What is claimed is:**

1 1. An apparatus for use in an optical network for providing specified  
2 communications signals to targeted recipients, said apparatus comprising:

3 one or more cross-connect devices for receiving communication signals on  
4 individual communication paths; and

5 one or more optical multiplexer units having inputs respectively coupled to  
6 outputs of said cross-connect devices,

7 wherein said cross-connect devices are operable to selectively distribute said  
8 communication signals on said individual communications paths to none, some or all  
9 inputs of said optical multiplexer units for distribution to said targeted recipients.

1 2. The apparatus of Claim 1, wherein said apparatus is placed within a  
2 ~~passive optical network.~~

1 3. The apparatus of Claim 1, wherein said specified communication signals  
2 are contained on various optical wavelengths, one or more selected wavelengths being  
3 representative of a target service for said target recipients.

1 4. The apparatus of Claim 1, wherein said optical network is a CATV  
2 network.

1 5. The apparatus of Claim 1, wherein said network is dynamically  
2 reconfigurable depending on changing customer needs.

1 6. The apparatus of Claim 1, further including a controller coupled to cross-  
2 connect devices and said optical multiplexers, said controller being operable to track  
3 connections and signal distribution of said cross-connect devices and said optical  
4 multiplexer units to thereby determine usage of said specified communications signal by  
5 said targeted recipients.

1 7. The apparatus of Claim 1, wherein said cross-connects include M inputs  
2 and said optical multiplexers include N outputs, said connections between said cross-  
3 connect devices and said optical multiplexer units being divided into M/N groups.

1        8.     The apparatus of Claim 1, further including a power splitter for splitting  
2 an incoming optical signal into a given number of outputs.

1        9.     The apparatus of Claim 8, wherein said optical network is a WDM  
2 network, further including one or more optical demultiplexing units respectively coupled  
3 between said power splitter and said cross-connect devices.

1        10.    The apparatus of Claim 1, wherein multiple ones of said apparatus are  
2 hierarchically distributed within said network.

1        11.    The apparatus of Claim 1, wherein said cross-connect devices are MEMs  
2 devices.

1        12.    The apparatus of Claim 1, wherein an additional one of said apparatus is  
2 utilized to direct upstream communications in said network.

1        13.    In a CATV distribution network, at least a portion of which includes  
2 optical distribution capabilities, an apparatus for providing selective distribution of  
3 specified signals to miniature fiber nodes in said network, said apparatus comprising:

4            one or more cross-connect devices for receiving said specified communication  
5 signals on individual communication paths; and

6            one or more optical multiplexer units having inputs respectively coupled to  
7 outputs of said cross-connect devices,

8            wherein said cross-connect devices are operable to selectively distribute said  
9 communication signals to inputs of said optical multiplexer units for targeted distribution  
10 to said miniature fiber nodes.

1        14.    The apparatus of Claim 13, wherein said specified communication signals  
2 are contained on various optical wavelengths, one or more selected wavelengths being  
3 representative of a target service for said target recipients.

1        15.    The apparatus of Claim 13, wherein said network is dynamically  
2 reconfigurable depending on changing customer needs.

16. The apparatus of Claim 13, further including a controller coupled to cross-connect devices and said optical multiplexers, said controller being operable to track connections and signal distribution of said cross-connect devices and said optical multiplexer units to thereby determine usage of said specified communications signal by targeted recipients coupled to said miniature fiber node.

17. The apparatus of Claim 13, wherein said cross-connects include M inputs and said optical multiplexers include N outputs, said connections between said cross-connect devices and said optical multiplexer units being divided into M/N groups.

18. The apparatus of Claim 13, further including a power splitter for splitting an incoming optical signal into a given number of outputs.

19. The apparatus of Claim 18, wherein said optical network is a WDM network, further including one or more optical demultiplexing units respectively coupled between said power splitter and said cross-connect devices.

20. The apparatus of Claim 13, wherein multiple ones of said apparatus are hierarchically distributed within said network.

21. In a CATV distribution network, at least a portion of which includes optical distribution capabilities, a method for providing selective distribution of specified signals to miniature fiber nodes in said network, said comprising the steps of:

receiving said specified communication signals on individual communication paths at on or more cross-connect devices;

respectively coupling inputs of one or more optical multiplexer units to outputs of said cross-connect devices,

controlling said cross-connect devices to selectively distribute said communication signals to inputs of said optical multiplexing units for targeted distribution to said miniature fiber nodes.

1           22. The method of Claim 21, wherein said specified communication signals  
2 are contained on various optical wavelengths, one or more selected wavelengths being  
3 representative of a target service for said target recipients.

1           23. The method of Claim 21 wherein a controller couples to cross-connect devices  
2 and said optical multiplexers, said controller being operable to track connections and  
3 signal distribution of said cross-connect devices and said optical multiplexer units to  
4 thereby determine usage of said specified communications signal by targeted recipients  
5 coupled to said miniature fiber node.

1           24. The method of Claim 21, further including the step of power splitting an  
2 incoming optical signal into a given number of outputs prior to being input to said cross-  
3 connect devices.

1           25. The method of Claim 24, wherein said optical network is a WDM  
2 network, further including the step of demultiplexing the power split signals prior to  
3 being input to said cross-connect devices.